Anirudh Singhal | **16D070032**
Electrical Engineering | **UG Third Year (Dual Degree)**
Indian Institute of Technology Bombay | **Male**
Specialization: Communication and Signal Processing | **DOB: 18.05.1998**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2019	9.25
Intermediate/+2	CBSE	The Khaitan School	2016	94.60
Matriculation	CBSE	Khaitan Public School	2014	10.00

Pursuing a **Minor Degree** in **Computer Science and Engineering** Department with minor degree CPI of **9.5**

Scholastic Achievements

- Awarded **AP Grade** for outstanding performance in the course on **Network Theory** *2017*
- Secured **All India Rank 368** out of 1.5 lakh candidates in **JEE Advanced** *2016*
- Recipient of prestigious **Kishore Vaigyanik Protsahan Yojana**(KVPY) Scholarship *2015*
- Awarded certificate of merit for statewise **top 1%** in **National Standard Examination in Physics** *2015*
- Qualified for **Indian National Chemistry Olympiad** (INChO) based on performance in NSEC *2015*

Internships

OkCredit, Bangalore *May'18-Jul'18*

OkCredit is a mobile based digital ledger for small businesses in India that extend credit to their customers

- Designed infrastructure to collect user interactions from the mobile app for targeted communication with them
  - Built a server in **Google Go** to store data in a **Cassandra** database and transfer it to **Amazon S3** daily
  - Created an **Android Library** to store the user data locally and send it to the server
- Developed user authentication service in Google Go based on **Oauth 2.0** for mobile and web applications
- Devised and performed **unit**, **load tests** of REST APIs to calculate their maximum load as function of resources

Key Projects

Electrical Subsystem, Advitiy *Feb'17-Present*

Advitiy is the 2nd student satellite of IITB, technically advanced and efficient version of the 1st, Pratham

- Critically analyzed various parameters and constraints to **finalize the microcontroller** of On Board Computer
- Proposed the use of **Real Time Operating System** (RTOS) to carry out the scheduling of tasks being run on the On Board Computer and conceptualized a **scheduling algorithm** for the same
- Performed **functionality test** on flight hardware of Pratham to get familiar with source code and its peripherals
- Interfaced **Magnetometer** with On Board Computer using **UART** Communication Protocol

Encrypted Audio Transmission using Chaotic Circuits *Apr'18*

Guide: Prof. Siddharth Tallur, Electrical Engineering *Course Project*

- Designed and implemented a third order **chaotic oscillator** for encryption and decryption of audio signals
- Encrypted audio signal using **white noise** created by the chaotic transmitting oscillator
- Coupled receiver with transmitter circuit to produce the same **unique chaotic noise** in order to recover the signal
- Simulated the system in **NGSpice** and verified the results by implementing the system on PCB

Lazy Lock: Automatic Lock *May'17-Jan'17*

Institute Technical Summer Project *Institute Technical Council*

- Designed and implemented an automated door unlocking mechanism which unlocks by **gesture detection**, **knock pattern** and remotely from an **android app** along with a Do not Disturb (DND) option
- Implemented **Image Processing** algorithms using **OpenCV** on **RaspberryPi** (RPi) for gesture recognition
- Improved gesture recognition accuracy by employing **Machine Learning** using **scikit-learn** in python
- Integrated RPi with **knock detector circuit** such that it unlocks only on a unique knock pattern

Technologies for Soldier Support *Dec'17-Jan'18*

Part of an 8 member team that represented IIT Bombay in the Inter IIT Technical Meet held at IIT Madras

- Fabricated a smart glove using **flex sensors** and **accelerometer** to detect soldier's hand gestures
- Built a headband which could monitor Soldier's important physiological parameters such as Heartbeat, Temperature and Head Impact Force using **optical pulse sensor, temperature sensor** and **accelerometer**

Reaction Game
Feb'18-Mar'18

Guide: Prof. M.P. Desai, Electrical Engineering — *Course Project*

- Designed an arcade game that tests the player's reflexes using a **CPLD board**
- Modelled the game as a **Finite State Mealy Machine** using the concepts of Register Transfer Level (RTL) for the operation of LEDs and push-buttons, and to display the player's score on an LED panel

DC Motor Speed Regulator
Mar'17

Guide: Prof. M.B. Patil, Electrical Engineering — *Course Project*

- Varied the speed of DC motor employing **Pulse Width Modulation** (PWM) technique using digital ICs
- Designed the circuit using **Preset Counter**, **J-K flip flops** and various other ICs

Multi-Client Server using Forking
Aug'17

Guide: Prof. Mythili Vutukuru, Computer Science Engineering — *Course Project*

- Programmed a **TCP server** in C++ which connects to various clients simultaneously
- Created a map which takes key-value pairs from clients and stores it, while also serving to any client

Positions of Responsibility

Subsystem Leader, Electrical Subsystem, Advitiy
Feb'18-Present

Advitiy is the 2nd student satellite of IITB, technically advanced and efficient version of the 1st, Pratham

- Spearheaded a **10 membered** inter-disciplinary team of two subdivisions, Power and On-Board Computer to design the power distribution circuit, interface with peripherals and implement the control algorithm
- Ensured implementation of **Quality Assurance Practices** to guarantee **100%** reliability
- Recruited **9 candidates** from over **100 applicants** by conducting a three stage selection procedure which tested technical skills, practical approach and teamwork
- Contributed to **Satellite 101 wiki**, a compilation of exhaustive knowledge of satellite project which reached **5.8k** page views and **1.4k** users around the globe within a month

Technical Skills

Languages	Google Go, SQL, VHDL, C, C++, Python, Embedded C, Java
Micro-controller Programming	Atmel Studio, ArduinoIDE, RPi
Simulation and CAD Softwares	Proteas, NGSpice, SolidWorks, AutoCAD
Other Softwares and Modules	Android Studio, GNURadio, Quartus, OpenCV, Scikit-Learn, Git

Key Courses Undertaken

Electrical Engineering	Signals and Systems, Analog and Digital Systems, Communication Systems*, Power Electronics, Microprocessors*
Computer Science	Digital Image Processing*, Introduction to Machine Learning*, Computer Networks, Data Structures and Algorithms
Mathematics and Statistics	Data Analysis and Interpretation, Probability and Random Processes*

**to be completed by November '18*

Extra Curricular Activities

- **Social Work**
  - Volunteered in **NGO Vidya** for tutoring financially and socially underprivileged children
  - Taught English to college kitchen staff as a part of **Adult Literacy Program (ALP)**, NSS
  - Devoted **80+ Hours** to Social Service under **National Service Scheme, IIT Bombay**
  - Helped in **organizing CURED**: a diabetes awareness campaign attempting **Guinness World Record** for maximum number of glucose level check-ups covering **200+ camps in 10 states**
- Successfully completed **Mountaineering Adventure Course (MAC)** which is affiliated to Government of India and Government of Jammu and Kashmir
- Successfully completed **Swimming Camp** conducted by sports council as a part of Summer of Sports
- Presented **Pratham, IIT Bombay Student Satellite** in a national exhibition before an audience of over 400